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A needed reform in  
abdominal surgery.





## A NEEDED REFORM IN ABDOMINAL SURGERY.

It is always harmful to pinch nerves. In the cerebro-spinal system it involves pain, in the sympathetic system it involves functional disturbance; in either system it involves shock and added danger to any and every surgical effort. For that reason the practice at present in vogue in certain surgical domains of squeezing large masses of tissue by either clamps or ligatures, for the purpose of controlling hemorrhage which can be better controlled in other and less harmful ways, should be abandoned.

The object of the present paper is to suggest a much-needed reform in abdominal surgery, especially that connected with the removal of ovarian, fibroid and cancerous tumors of the uterus and its appendages.

At the present time there are a good many ways of closing the abdominal wound after a celiotomy. While most of the prominent operators are beginning to appreciate the importance of coaptating the tissues separately, employing one tier of sutures for the coaptation of the margins of the wounded peritoneum, another tier to hold in coaptation the recti muscles and their sheath, and a third to approximate the severed margins of the integument, it is still a common practice in addition to these rows of sutures to stay them with several deep, heavy sutures which are made to transfix the full thickness of the abdominal walls on either side, thus securing a firm grasp upon the abdominal wound and holding the severed tissues firmly and snugly together. Many operators vary this last proceeding and simply include in their deep ligatures the skin and muscular structures. These deep sutures we should like to see abandoned for two reasons. First, they are unnecessary. There is no tendency of the margins of the peritoneum to separate and consequently a continuous suture of catgut can safely be relied upon to hold its severed margins in contact. The peritoneal surfaces unite so quickly that firm union is secured before the catgut absorbs. In the muscular walls the direction of the recti muscles is such that when their margins are coapted, there is little tendency with them to separate, and a few interrupted sutures of silk or catgut, at the discretion of the operator, can be



relied upon to hold them in contact until union has taken place. I am not at all certain that it is good practice to even cause the central sutures to pierce the recti muscles. Theoretically it should be sufficient to bring together the sheaths of the muscles by either a continuous suture of silk or else a sufficient number of interrupted sutures to hold every portion of it in close coaptation. As this suggestion is still theoretical so far as the practice of the author is concerned, he is unable to give it the endorsement of experience. Muscular tissue is cowardly, and the slightest touch of its substance throws it into violent contraction, and so it seems reasonable to conclude that the stitching of muscles is to be avoided when the surgical object can be accomplished without it. Tendonous structures do not unite so rapidly as do serous membrane, muscular tissue or the integument, and, for that reason, while willing to trust to catgut in suturing peritoneal or skin surfaces, it would take a large number of uniformly successful cases to satisfactorily establish the reputation of catgut with the author of the present article in the suturing of tendons. Therefore, for the middle row of sutures, which should bring together at least the severed margins of the sheaths of the recti muscles, the stitches should be of silk or something more substantial than catgut. A single instance of hernia occurring from abandoning the practice of stitching together the recti muscles themselves, would very much discourage the opinion that it is sufficient to bring together the margins of the severed sheaths of the recti muscles, but upon theoretical grounds it is the proper thing to do. For the integument a continuous suture of catgut is ample and so satisfactory that it leaves nothing to be desired. As the operator has closed with uniform success a large number of abdominal wounds without the employment of deep sutures, he feels amply justified in his position that they are wholly unnecessary. The second reason why we should like to see the deep abdominal sutures abandoned, is because they add to the shock and are otherwise harmful. Imagine a person in ordinary health, seized just below the umbilicus by deep ligatures which should pinch tightly skin, muscles and peritoneum or skin and muscles merely. The shock of perpetual pain would be terrible. It would certainly be no less severe after a celiotomy, and in this latter case, in addition to the pain and increased shock involved, these deep sutures by unduly pinching would materially interfere with the nutrition of the part and consequently would imperil healing by first intention. Stitch abscesses are not uncommon, and would they not be entirely unheard of if these deep sutures were abandoned?

When an exploratory incision has been made through the abdominal walls and the morbid growth encountered is ascertained to be an

ovarian tumor, there are two ways in common vogue of securing the pedicle. The term, securing the pedicle, is used advisedly because the operator does not seem satisfied to secure the arteries but feels called upon to really secure the entire pedicle. For what purpose who can tell? His sole object should be to guard against hemorrhage and there is no reason why he should exercise personal animosity, vindictiveness or cruelty against those tissues which have no tendency to bleed. All that really needs the attention of his ligatures therefore if he need to employ them are the arteries themselves and not the other tissues which constitute the substance of the pedicle itself. The great army of laparotomists at present, however, are practicing the securing of the pedicle, however harmful the practice may be. This is done either by clamp or ligature. The instrument stores abound with pedicle clamps and they have not entirely passed out of favor although, fortunately, their use is already beginning to wane. Where the pedicle is long it is still the practice of some surgeons to seize the entire mass of tissue, peritoneum, blood vessels, nerves, lymphatics, and areolar tissue in the deadly grip of a powerful clamp, which is left outside of the abdominal cavity dangling to the amputated stump. It is taken away when it rots away. The method more popular at present, however, is to first seize the broad ligament with a heavy clamp, cut away the tumor, and afterwards treat the entire pedicle to a snug ligaturing by segments, two, three or more, according to the size of the pedicle. As soon as the ligatures are all thoroughly tightened the clamp is removed and the stump returned to the abdominal cavity. In sessile tumors this has been the only satisfactory solution of the problem of how to secure the pedicle. Nothing need be said of the occasional slipping of these ligatures because it is unnecessary with the exercise of proper care. But a great deal ought to be said about the harmful effects of ligating large masses of sensitive tissue. Aside from shock to the sympathetic nervous system and the consequent severe disturbance of organic functions it is bad surgical practice to completely cut off the nutrition from any tissue which is to be dropped back into the abdominal cavity. It must either slough, become septic and institute dangerous conditions, or remain as a foreign body to be buried in a fibrous grasp of organized lymph, receiving its nourishment by an appeal to the serous surfaces with which it comes in contact, giving rise to undesirable adhesions and favoring future congestions and inflammations.

Iconoclasts as a race are not warm friends of humanity, because they destroy our faith in measures which although imperfect are fre-

quently productive of much good, and offer nothing better in their stead. Genuine reform, however, is a different matter, and blame-worthy measures should be abandoned as soon as better ones are known.

There is a better way of handling these ovarian pedicles than sloughing them with clamps or choking them to death with ligatures and the better way has all the advantages of the present practice without its objections. That is to say, it is just as reliable and satisfactory in preventing hemorrhage and its dispenses with the danger of sloughs and the harm of ligating large bundles of sympathetic nerve fibres and sensitive peritoneal and areolar surfaces.

In all ovarian tumor pedicles there are only a very few large blood vessels, and it is a simple matter when the broad ligament is held in an accessible position by T forceps to secure these as they are severed by the application of artery forceps. The severed arteries can then be tied, or what is still better, can be treated after the manner spoken of in describing the fifth case furthur on in the present article. As soon as the tumor is severed and the arteries are secured, the margins of the peritoneum should be carefully stitched together by a continuous suture of catgut so as to leave no wounded surface exposed in the abdominal cavity. This prevents all oozing into the peritoneal surface from inflammatory processes and consequent adhesions, saves all pinching of nerves, and is invariably happy in its results. These remarks apply also to the removal of the body of the uterus for fibroid or cancerous degeneration.

The Trendenlenberg position is usually desirable for the removal of the body of the uterus and the ovaries and tubes by the abdominal route. After the abdomen has been entered, the diagnosis made, and the removal of the organs decided upon, the patient should then be placed in the Trendenlenberg position and by means of a large curved needle a heavy silk thread should be made to transfix the centre of the uterus as close to the surface as possible, care being taken to avoid puncturing the bladder in front or intestine or omentum behind. The object of this thread is to furnish a guy rope for the subsequent handling of the stump. T forceps should be fixed to both ends of the string, which should be of sufficient length to permit the forceps to be well out of the field of operation. The ovaries and tubes should then be carefully dissected from the peritoneal attachments from without inwards, great care being taken to carry the dissection close to the organs. As soon as the dissection has been made as far as the uterine body the wounded surfaces of the peritoneum should be closed on each side by a continuous suture of catgut. The operator should now dis-

sect the broad ligaments away from the sides of the body of the uterus. To accomplish this nicely the peritoneum should be severed close to the margins of the uterus, first anteriorly and then posteriorly, and then while the uterus is being held well out of the abdominal cavity by the aid of a three or four-pronged double vulsellum in the hands of an assistant, the operator can dissect away the areolar tissue and blood vessels from the sides of the uterus. Should an abnormal development of blood vessels, which are usually small, cause excessive hemorrhage from the uterine side of the wound a deep suture of heavy silk, tightly secured, will place it under immediate control. The hemorrhage from the broad ligament side can easily be secured by ligating the blood vessel or by leaving the artery forceps attached to it until it can be treated later on after the manner described in the fifth case, soon to be spoken of. The dissection should be carried in this manner well down into the pelvic basin until the point is reached at which the amputation of the uterus is to be made. After the dissection has been accomplished on both sides the amputation of the uterus is a very simple matter. It should be a flap amputation, so that the subsequent stump will present a well shaped rounded form. As soon as the anterior-posterior flaps have been made, the uterus and its appendages are then freed from their attachments and can be taken away. The guy rope should now be transformed into a suture so as to bring the lips of the uterine stump into immediate coaptation. The continuous sutures on either side which were employed to coapt the margins of the peitoneum which mark the attachments of the ovaries and tubes should now be continued downwards so as to cover the wounded surface caused by the amputation of the broad ligaments, and on still farther so as to bring together carefully the margins of the uterine flaps. The sutures on the two sides, if their length has been properly estimated, will meet in the middle of the uterine stump and can now be fastened together. The original guy rope can then be cut upon one side and removed, and the operation is complete. The only knots aside from the one formed by the meeting of the continuous sutures in the centre of the uterine stump and the two where the continuous suture was started are those formed by the ligatures securing the arteries. These are completely excluded from the abdominal cavity by the continuous suture which brings together the severed margins of the peritoneum, so that the final result of the entire operation leaves nothing pinched but the arteries, leaves no wounded surface opening into the peritoneal cavity, and the only appearance which marks the entire operation is a continuous suture from one side of the pelvis to the other, which brings together the wounded

peritoneal surface, upon two sides those of the broad ligaments and in the centre those which cover the anterior and posterior surface of the uterus. The abdominal wound is then to be closed after the manner just described.

Patients operated upon in this manner suffer less pain, less shock, less nausea, make quicker and more satisfactory recoveries; and it is to be hoped that the superiority of the method will be sufficiently appreciated by abdominal surgeons to be deemed worthy of their adoption. In illustration of the method described the following cases are submitted for consideration.

CASE 1. Single; aged 56; weight 180 lbs.; had been abandoned by several prominent gynecologists and surgeons as a hopeless case for operation and dismissed with the prognosis of death at the end of three or four weeks; was just recovering from a severe attack of peritonitis; was admitted for treatment March 21, discharged April 24. Time of operation nearly an hour and a half. Position employed, Trendenlenberg. Conditions encountered, a large polycystic ovarian tumor of the right side weighing 36 pounds, small tumor about the size of a large orange developed from the left ovary, the uterus presenting an intramural fibroid as large as a small cocoanut, adhesions slight, and these were broken up. Both ovaries and tubes and the body of the uterus were removed after the manner just described, no ligatures were applied except to arteries; no clamps were employed, no drainage; highest pulse was 104, highest temperature 102 6-10, which occurred on the seventeenth day as a result of an effort to obtain free action of the bowels. The temperature was seldom over 99½ and pulse seldom higher than 100 throughout the entire history of the case. Recovery was made with a minimum of pain; all wounds healed by first intention; result perfect in every particular; patient well and happy.

CASE 2. Aged 43; weight 205 lbs. Operated upon May 7, discharged June 4. Highest pulse 120, highest temperature 101 2-5, occurring on the thirteenth day, cause, constipation; lowest pulse during the entire history of the case 60, lowest temperature 97 6-10; pulse usually between 60 and 90, temperature usually from 98 to 99½. Patient timid, sensitive, and full of anxiety, but passed through the entire ordeal without severe suffering or without dangerous conditions; the wound healed by first intention. Position employed, Trendenlenberg. Conditions encountered, right ovary cystic and sessile, left ovary cystic, prolapsed, also sessile; both ovaries about the size of large apples; uterus presenting five-pound intramural fibroid. The ovaries were enucleated, as they possessed no pedicle, otherwise the

operation was performed as previously described. Recovery perfect.

CASE 3. Operated upon May 11, discharged June 14; weight 135 lbs.; age 38. Pulse on the morning before the operation 66, temperature 99 2-5. Position employed, Trendenlenberg. Conditions encountered, ovarian tumor on right side weighing eight pounds; left ovary cystic, but no larger than a lemon; uterus hypertrophied. Highest pulse following the operation 92, highest temperature 101; lowest pulse 57, lowest temperature 97 6-10. All wounds healed by first intention. Patient out of bed on the fourteenth day; no pus; no pain, recovery perfect and uneventful.

CASE 4. Age 48; weight 120 lbs.; operated upon June 28. On the morning of the operation pulse was 82, temperature 99 2-10. Was a very remarkable case. General condition diagnosed as locomotor ataxia. Had been unable to stand on her feet for three years; had showed dropsical tendency for between one and two years; heart palpitation so as to compel sitting posture for last four months; dropsy of the lower extremities so excessive that her ankles were as large around as the thighs of one in ordinary flesh; total inability to move lower limbs or even the toes; the legs below the knees presenting extreme cases of eczema, the surfaces being badly inflamed and ulcerated; abandoned by prominent Eastern surgeons as a hopeless case; journey West said to be impossible; she arrived safely, however, was successfully anesthetized and operated upon. Position employed, Trendenlenberg. Conditions encountered, left ovary and tube atrophied, right ovary size of a small orange, presenting ovarian cyst; uterus presenting fibroid degeneration, tumor weighing  $5\frac{1}{4}$  pounds. Time of operation, fifty minutes. The operation performed as previously described. Subsequent to the operation fifty per cent. of the dropsy of the limbs disappeared in twenty-four hours; the eczema began to fade away at once; the patient could easily assume the recumbent posture; all wounds healed by first intention. The patient suffered no pain and was extremely happy during the entire convalescence. Three weeks later she was given the American operation for the cure of her constipation and to aid in the recovery of her spinal cord affection. At the present writing eczema almost entirely vanished, dropsy gone, slight ability to move limbs and toes, general condition wonderfully improved; will be discharged in about ten days. Was completely convalesced from the laparotomy at the end of the third week.

CASE 5. Age 45; weight 160 lbs. Operated upon July 20; date of present writing, July 25. Time of the operation one hour and fifteen minutes. Position employed, Trendenlenberg. Conditions

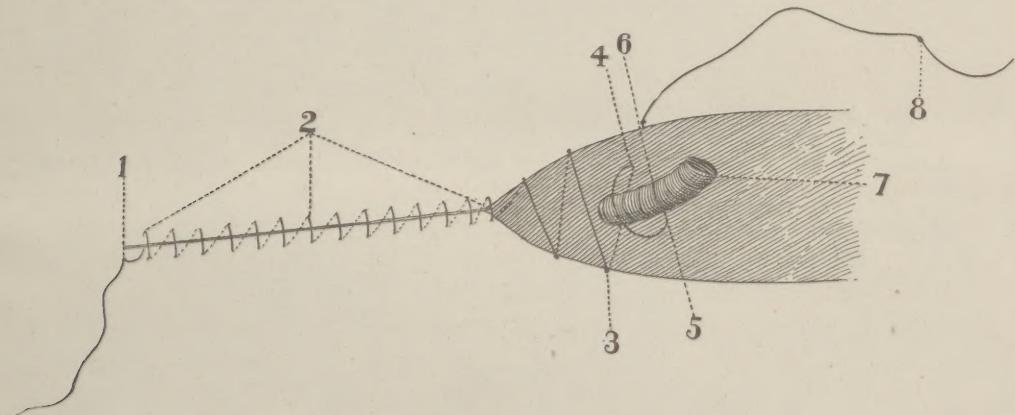
encountered, sarcoma of the lower border of the omentum, badly adherent to pelvic organs; at least two dozen small cancerous tumors in the lower part of the mesentery; uterus hypertrophied; ovaries and tubes enlarged and inflamed. The lower third of the omentum amputated and the tumor removed. The wounded margins of the omentum were stitched by a continuous suture. The small tumors in the mesentery were cut out and the wound stitched. The ovaries and uterus were removed as in the manner employed in the previous cases, with the exception of the manner of securing the arteries. As the arteries were encountered, one by one they were seized with artery forceps and the operation proceeded with until the ovaries, tubes and uterus were entirely removed. Then the continuous suture was applied on each side, beginning with the outer extremity of the wounds in the peritoneum. The surfaces were whipped together as far as the attachment of the first artery forceps. At this point the stitch, instead of simply securing the edge of the peritoneum, was passed deeper so as to come out in the middle of the wounded surface just beyond the arteries secured by the T forceps. It was again made to enter the wounded surface, only on the opposite side, and made to transfix the farther margin of the peritoneum. In this way a loop of the continuous thread was thrown around the artery so that when the thread was tightened to bring the margins of the peritoneum together the loop surrounding the artery was tightened sufficiently to control the hemorrhage, thus avoiding the necessity of a separate ligature and knot, saving both time and other applications. The forceps were then removed and the continuous suture carried still further until the next artery forceps was encountered, when the same manoeuvre was practiced, and so on until the entire margins of the broad ligaments and the uterine flaps were secured by one continuous suture, there being but three knots employed in the entire operation, and those were at the beginnings and end of the continuous suture. In the five days which have transpired since the operation the highest pulse has been 100, the highest temperature 99 6-10; the lowest pulse 76, the lowest temperature 97. The patient has had neither pain, nausea, nor inconvenience. She has slept every night, and enjoys her food. Her bowels moved on the third day. Although the case is a recent one it promises to be a very remarkable one.

The following is a cut of the stitch which was employed to secure the bleeding points. This stitch economizes ligatures and both time and strength of the operator and patient to such an extent, as to be worthy of record and universal employment. It dispenses with the

knots of the ligatures, and seems to be a great improvement upon the customary methods of securing the arteries.

None of these patients has been restless, suffered from nausea or been unhappy. On the contrary, their convalescence has been uniformly rapid and joyful, more than usually free from nausea, and the uniform satisfaction which has prevailed throughout the histories of all of them can be satisfactorily explained only upon theory, and that is, that there was no tension of the abdominal walls by tightly drawn deep sutures, there was no deadly grip made upon masses of tissue by either clamps or ligatures, and, although the operations were all of them very formidable and the general conditions in some of the patients was quite desperate, the happiest results were quickly obtained in every case.

The official philosophy has been waging a crusade against the pinching of terminal nerve fibres by irritable sphincters. The justice



1. Beginning of continuous suture.
2. Continuous suture coaptng edges of wound.
3. Point at which needle, instead of coming out close to margin of wound, is made to pass beneath and beyond the artery, coming out in wounded surface just beyond artery.
4. Point at which the stitch emerges.
5. Point at which needle enters wounded surface.
6. Point at which needle again emerges.
7. Artery. Drawing the thread then coapts the wounded margins and tightens the loop thrown around the artery. The forceps can now be removed.
8. Needle

of its cause is now beginning to be thoroughly appreciated, but it seems that it is destined to affect a greater emancipation than the mere relief of terminal nerve irritation at the lower openings of the body. In the light of what has just been said, one of the results of its disclosures will be to revolutionize the present practice of some forms of abdominal surgery.

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